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I, JANENE PEISKER, TEAM LEADER EXAMINATION SUPPORT AND SALES hereby certify that annexed is a true copy of the Provisional specification in connection with Application No. 2004903639 for a patent by CONCRETE SLAB TECHNOLOGY PTY LTD as filed on 05 July 2004.

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WITNESS my hand this
Eighth day of August 2005

A handwritten signature in black ink, appearing to read 'J. Peisker'.

JANENE PEISKER
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AUSTRALIA
Patents Act 1990

PROVISIONAL SPECIFICATION

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Invention Title: A Method of Forming Cracks in Concrete

This invention is described in the following statement:

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This invention relates to forming cracks in concrete. In particular, the invention relates to a method of forming stress-relieving cracks in concrete paths, slabs or pavements.

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The invention will be described by way of example with reference to forming cracks in concrete paths, slabs or pavements. It should be appreciated that this description is given by way of example only and that the method of the invention may be used for other purposes also. The method of the invention may be used for
10 allowing concrete articles to be cut into two or more pieces and may also be used for demolishing slabs, paths, pavements or other concrete articles or for promoting cracks in concrete articles other than paths, slabs or pavements.

With a single pour for a concrete path, slab or pavement, joints are
15 installed at intervals in an effort to have the joints crack and thereby accommodate subsequent concrete shrinkage/expansion either side of the joint. One way in which such joints are provided is by forming crack promoting grooves in the exposed top surface of the concrete. These grooves can be formed in the concrete with tools or insert as part of the concrete finishing process or they can be formed by concrete
20 sawcutting after the concrete finishing process. These grooves provide lines of weakness along which cracks can develop during the life of the concrete path, slab or pavement. Another way in which such joints are provided is by casting in a crack promoting insert during concrete placement. The insert may have any suitable shape or size. Preferably, the insert is "T" shaped and is placed in an inverted orientation
25 below the groove if used. These crack promoting inserts positioned prior to concrete placement provide lines of weakness along which cracks can develop during the life of the concrete path, slab or pavement. Crack promoting inserts can be used in a joint in combination with a crack promoting groove. Preferably, in such cases, the insert is immediately below the groove although the insert may be below and to one side of the
30 groove if desired.

The time taken for a crack promoting groove or insert to create a crack

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depends on a range of variables including friction developed between the underside of the concrete path, slab or pavement and the supporting subgrade, rate of concrete tensile strength development in the concrete, ambient temperature changes, rate of drying shrinkage of the concrete etc. Some crack promoting grooves and inserts never
5 create a crack.

Ideally all crack promoting grooves and inserts would create cracks immediately after completion of construction of the concrete path, slab or pavement. Then each crack created by a groove or insert would accommodate only the concrete
10 shrinkage/expansion either side of that groove or insert.

In practice, both crack promoting grooves and inserts create cracks at varying times after completion of construction of the concrete path, slab or pavement and sometimes no crack is created. When cracks are created at varying times the
15 crack promoting groove or insert that creates a crack first must accommodate all the concrete shrinkage/expansion of the concrete until another crack promoting groove or insert creates a crack. This results in joints with crack promoting grooves or inserts that create cracks early opening wider than those with crack promoting grooves or inserts that create cracks later. Cracked joints that open too wide are undesirable as
20 they typically perform poorly during the life of the concrete path, slab or pavement.

Crack promoting grooves that are formed by concrete sawcutting are often cut deep in an effort to promote cracking. This is expensive and the deep sawcut reduces the ability of the cracked joint to transfer shear loads across the joint
25 using aggregate interlock of the cracked concrete on each side of the cracked joint.

It is an object of the present invention to provide a method of forming cracks in concrete articles which at least minimises the disadvantages referred to above.
30

According to one aspect of the invention there is provided a method of forming cracks in concrete articles, the method includes the steps of:

(i) positioning a bolster on the surface of a concrete article which has no crack promoting grooves or inserts;

(ii) striking the bolster against the concrete article to promote the formation of a crack; and,

5 (iii) progressively moving the bolster to different positions on the concrete article, repeating (i) and (ii) thereby creating a pattern of cracks in the concrete article.

10 According to another aspect of the invention there is provided a method of forming cracks in concrete articles, the method includes the steps of:

(i) positioning a bolster on the surface of a concrete article which has a grid of crack promoting grooves. If the groove is not large enough to receive the bolster, the bolster may be positioned adjacent to or above the groove;

15 (ii) striking the bolster against the concrete article to promote the formation of a crack along the groove; and, wherein

(iii) if the width of the bolster is less than the length of the groove, the bolster may be progressively moved to different locations along the groove and struck against the concrete at ~~each~~ ^{each} location.

20 According to another aspect of the invention there is provided a method of forming cracks in concrete articles, the method includes the steps of:

(i) positioning a bolster on the surface of a concrete article which has a grid of crack promoting inserts. The bolster may be positioned adjacent to or above the insert;

25 (ii) striking the bolster against the concrete article to promote the formation of a crack along the insert; and wherein

(iii) if the width of the bolster is less than the length of the insert, the bolster may be progressively moved to different locations along the insert and struck against the concrete at each location.

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According to another aspect of the invention there is provided a method of forming cracks in concrete articles, the method includes the steps of:

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(i) positioning a bolster on the surface of a concrete article which has a grid of crack promoting grooves and inserts in combination. If the groove is not large enough to receive the bolster, the bolster may be positioned adjacent to or above the groove;

5 (ii) striking the bolster against the concrete article to promote the formation of a crack between the groove and insert; and wherein

(iii) if the width of the bolster is less than the length of the groove and insert in combination, the bolster may be progressively moved to different locations along the groove and insert and struck against the concrete at each location.

10

The bolster may be of any width or thickness.

Striking the bolster against the concrete article may involve resting the bolster against the article and then striking the bolster with a hammer or other
15 apparatus which is suitable for this purpose. Alternatively, a mechanical drive which is coupled to the bolster may be operated to strike the bolster against the article.

A plurality of bolsters may be used, positioned substantially adjacent to the groove or insert if utilized in the concrete article and each bolster may be struck
20 against the article to promote the formation of a crack, along the groove or insert if utilized. The bolsters may strike the article simultaneously. Alternatively, the bolsters may strike the article at different times. For example, the bolsters may strike the article sequentially.

25 The grooves in the concrete article may be the grooves that are formed in the article during the concrete finishing process and along which cracks do not form. Alternatively, grooves may be cut in the concrete after the concrete finishing process.

30 The insert in the concrete article may be the insert cast in the article during concrete placement.

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It is to be understood that the term "bolster" as used herein refers to any apparatus which is suitable for striking a concrete article and promoting the formation of a crack therein.

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